REMARKS:

Status

After this response, claims 86, 87, 89, 90, 92 to 98, 100, 101, and 103 to 107 are pending. Claims 86, 87, 97, and 98 have been amended, and claims 88, 91, 99 and 102 have been cancelled. Claims 86 and 97 are the independent claims. Reconsideration and further examination are respectfully requested.

Section 101 and 112 rejections

Claims 86 to 96 were rejected under 35 U.S.C. § 112, ¶ 1, as reciting a single means. Claims 86 to 107 were rejected under 35 U.S.C. § 112, ¶ 2, as having a "gap" between the elements. Claims 86 to 107 were rejected under 35 U.S.C. § 101 as reciting non-statutory subject matter. Applicants have amended claims 86 and 97 to address the issues raised in the section 101 and 112 rejections.

In particular, claim 86 has been amended to recite more than one element, and the claims have been amended to provide better interconnection between their respective elements and the apparatus (claim 86) and method (claim 97) recited by those claims. These changes address the section 112 rejections.

With respect to the § 101 rejection, Applicants submit that the elements of claims 86 and 97 as amended are not directed to a mere data structure, i.e., a storage block. Rather, claim 86 recites an apparatus that attempts to protect data and elements. The apparatus includes an array of

disk drives and a controller. These are concrete elements, not abstract ideas. Furthermore, the features of the elements clearly relate to the protection of data by the apparatus. Likewise, claim 97 recites a method including steps that are not merely abstract ideas. Rather, the steps describe how data is stored so as to protect that data.

In view of the foregoing, reconsideration and withdrawal are respectfully requested of the section 101 and 112 rejections.

Section 102 and 103 Rejections

Claims 86, 91 to 93, 97, and 102 to 104 were rejected under 35 U.S.C. § 102(b) over U.S. Patent No. 5,864,440 (Hashimoto). Claims 87 to 90 and 98 to 101 were rejected under 35 U.S.C. § 103(a) over Hashimoto in view of U.S. Patent No. 5,386,425 (Kim). Claims 94 to 96 and 105 to 107 were rejected under § 103(a) over Hashimoto in view of U.S. Patent No. 5,864,655 (Dewey).

Claims 86 to 96: Amended claim 86 recites the following:

> 86. An apparatus that stores data and attempts to protect said data from storage errors, comprising
>
> an array of disk drives, each of said disk drives having a plurality of storage blocks; and
>
> a controller that controls said array of disk drives;
>
> wherein said controller controls storage of said data in said array of disk drives such that at least some of said storage blocks store at least part of said data and a block appended checksum that protects said part of said data from said storage errors, said block appended checksum including one or more checksums and one or more block numbers including at least a virtual block number and a disk block number, with at least one of said checksums being an embedded checksum that checks integrity of said block appended checksum and

wherein said block appended checksum provides sufficient data to detect sector slides and misdirected reads and writes.

The applied art is not seen by Applicants to recite use of a block appended checksum that includes at least a virtual block number and a disk block number along with an embedded checksum that checks integrity of the block appended checksum.

The Office Action cited Hashimoto's LBA as substantially including "both virtual and absolute disk block numbers, LBA and ABA." As stated in the Office Action, Hashimoto does teach that "virtual block numbers LBA are made to correspond to absolute disk block numbers ABA." However, this is not equivalent to storing both virtual and absolute disk block numbers as separate entities, as recited for the claimed block appended checksum. Rather, Hashimoto teaches obtaining an ABA from an LBA. See Hashimoto, col. 5, lines 23 to 33.

In addition, even if Hashimoto taught storage of LBA and ABA as separate entities, Applicants respectfully submit that the applied art would not teach the claimed block appended checksum. This checksum has a unique combination of elements, namely at least a checksum of data, a virtual block number, a disk block number, and an embedded checksum. This combination of elements permits the block appended checksum to detect a wider variety of errors than other types of checksums. For example, the application discusses detection of sector slides and misdirected reads and writes. None of the applied references mentions these types of errors.

To emphasize this difference from the applied art, Applicants have amended claim 86 to further recite that the "block appended checksum provides sufficient data to detect sector slides

and misdirected reads and writes." Applicants submit that the applied art does not teach this capability.

In view of the foregoing, claim 86 and its dependent claims 87 to 96 are believed to be allowable over the applied art. Such an indication is respectfully requested.

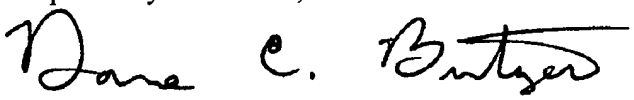
Claims 97 to 107: These claims recite a method that utilizes a block appended checksum that has the elements and capabilities discussed above with respect to claims 86 to 96. Accordingly, allowance of these claims also is respectfully requested.

Closing

In view of the foregoing amendments and remarks, the entire application is believed to be in condition for allowance, and such action is respectfully requested at the Examiner's earliest convenience.

Applicants' undersigned attorney can be reached at (614) 486-3585. All correspondence should continue to be directed to the address indicated below.

Respectfully submitted,



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